

# 7.0 References

### Section 1.0 Introduction

Dirkes, R.L., and R.W. Hanf. 1996. Hanford Site Environmental Report for Calendar Year 1995. PNNL-11139, Pacific Northwest National Laboratory, Richland, Washington.

### Section 2.0 Contaminants

42 USC 4321 et seq. (as amended). January 1, 1970. National Environmental Policy Act of 1969. Public Law 91-190.

42 USC 6901 et seq. October 21, 1976. Resource Conservation and Recovery Act of 1976. Public Law 94-580.

USC 9601 et seq. (as amended). December 11, 1980. Comprehensive Environmental Response, Compensation, and Liability Act of 1980. Public Law 96-510.

Baker, D.A. and J.K. Soldat. 1992. Methods for Estimating Doses to Organisms from Radioactive Materials Released into the Aquatic Environment. PNL-8150, Pacific Northwest Laboratory, Richland, Washington.

Bisping, L.E. 1992. Hanford Site Environmental Data 1991-Surface and Columbia River. PNL-8149, Pacific Northwest Laboratory, Richland, Washington.

Bisping, L.E. 1994. Hanford Site Environmental Data for Calendar Year 1993 - Surface and Columbia River. PNL-9824, Pacific Northwest Laboratory, Richland, Washington.

Bisping, L.E., and R.K. Woodruff. 1993. Hanford Site Environmental Data for Calendar Year 1992 - Surface and Columbia River. PNL-8683, Pacific Northwest Laboratory, Richland, Washington.

Blanton, M.L., W.W. Gardiner, and R.L. Dirks. 1995. Environmental Monitoring of Columbia River Sediments: Grain-Size Distribution and Contaminant Association. PNL-10535, Pacific Northwest Laboratory, Richland, Washington.

Cline, C.S., J.T. Rigger, and J.R. Raymond. 1985. Ground-Water Monitoring at the Hanford Site, January - December 1984. PNL-5408, Pacific Northwest Laboratory, Richland, Washington.

Cooper, A.T., and R.K. Woodruff. 1993. Investigation of Exposure Rates and Radionuclide and Trace Metal Distributions Along the Hanford Reach of the Columbia River. PNL-8789, Pacific Northwest Laboratory, Richland, Washington.

CRITFC - Columbia River Inter-Tribal Fish Commission. 1994. A Fish Consumption Survey of the Umatilla, New Perce, Yakima, and Warm Springs Tribes of the Columbia River Basin. CRITIC Technical Report No. 94-3, Portland, Oregon.

Dirkes, R.L. 1993. Columbia River Monitoring: Distribution of Tritium in Columbia River Water at the Richland Pumphouse. PNL-8531, Pacific Northwest Laboratory, Richland, Washington.

Dirkes, R.L. 1994. Summary of Radiological Monitoring of Columbia River Water along the Hanford Reach, 1980 through 1989. PNL-9223, Pacific Northwest Laboratory, Richland, Washington.

Dirkes, R.L., and R.W. Hanf. 1995. Hanford Site Environmental Report for Calendar Year 1994. PNL-10574, Pacific Northwest Laboratory, Richland, Washington.

Dirkes, R.L., G.W. Patton, and B.L. Tiller. 1993. Columbia River Monitoring: Summary of Chemical Monitoring Along Cross Sections at Vernita Bridge and Richland. PNL-8654, Pacific Northwest Laboratory, Richland, Washington.

Dirkes, R.L., R.W. Hanf, R.K. Woodruff, and R.E. Lundgren. 1994. Hanford Site Environmental Report for Calendar Year 1993. PNL-9823, Pacific Northwest Laboratory, Richland, Washington.

DOE - U.S. Department of Energy. 1987. Final Environmental Impact Statement, Disposal of Hanford Defense High-Level, Transuranic, and Tank Wastes, Hanford Site, Richland, Washington. DOE/EIS-0113, Washington, D.C.

DOE - U.S. Department of Energy. 1989. Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington, Draft Environmental Impact Statement. DOE/EIS-0119D, Washington, D.C.

DOE - U.S. Department of Energy. 1990a. Remedial Investigation/Feasibility Study Work Plan for the 300-FF-5 Operable Unit, Hanford Site, Richland, Washington. DOE/RL 89-14, Richland, Washington.

DOE - U.S. Department of Energy. 1990b. Remedial Investigation/Feasibility Study Work Plan for the 300-FF-1 Operable Unit, Hanford Site, Richland, Washington. DOE/RL 88-31, Richland, Washington.

DOE - U.S. Department of Energy. 1990c. Low-Level Burial Grounds Dangerous Waste Permit Application: Request for Exemption from Lined Trench Requirements for Submarine Reactor Compartments. DOE/RL-88-20, Supplement 1, Richland, Washington.

DOE - U.S. Department of Energy. 1992a. Sampling and Analysis of 100 Area Springs. DOE/RL-92-12, Rev. 1, Richland, Washington.

DOE - U.S. Department of Energy. 1992b. Hanford Site Groundwater Background. DOE/RL-92-23, Richland, Washington.

I-7.2 DRAFT DOE/RL-96-16



- DOE U.S. Department of Energy. 1992c. Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington (Final Environmental Impact Statement). DOE/EIS-0119F, Washington, D.C.
- DOE U.S. Department of Energy. 1992d. Low-Level Burial Grounds Dangerous Waste Permit Application: Request for Exemption from Lined Trench Requirements and from Land Disposal Restrictions for Residual Liquid at 218-E-12B Burial Ground Trench 94. DOE/RL-88-20, Supplement 1, Revision 1, Richland, Washington.
- DOE U.S. Department of Energy. 1993a. Limited Field Investigation Report for the 100-BC-5 Operable Unit. DOE/RL-93-37, Draft A, Richland, Washington.
- DOE U.S. Department of Energy. 1993b. Limited Field Investigation Report for the 100-DR-1 Operable Unit. DOE/RL-93-29, Draft A, Richland, Washington.
- DOE U.S. Department of Energy. 1993c. Limited Field Investigation Report for the 100-HR-1 Operable Unit. DOE/RL-93-51, Draft A, Richland, Washington.
- DOE U.S. Department of Energy. 1993d. Limited Field Investigation Report for the 100-HR-3 Operable Unit. DOE/RL-93-43, Draft A, Richland, Washington.
- DOE U.S. Department of Energy. 1994a. Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes. DOE/RL-92-24, Rev. 2, Vol. 1 of 2. Richland, Washington.
- DOE U.S. Department of Energy. 1994b. Annual Report for RCRA Groundwater Monitoring Projects at Hanford Site Facilities for 1993. DOE/RL-93-88, Rev. 0, Richland, Washington.
- DOE U.S. Department of Energy. 1994c. HEIS Hanford Environmental Information System. For documentation supporting the HEIS database, see DOE/RL-93-24, 9 volumes, Richland, Washington. Queried: August 24, 1994.
- DOE U.S. Department of Energy. 1994d. Limited Field Investigation Report for the 100-BC-1 Operable Unit. DOE/RL-93-06, Richland, Washington.
- DOE U.S. Department of Energy. 1994e. Limited Field Investigation Report for the 100-KR-1 Operable Unit. DOE/RL-93-78, Draft A, Richland, Washington.
- DOE U.S. Department of Energy. 1994f. Limited Field Investigation Report for the 100-KR-4 Operable Unit. DOE/RL-93-79, Richland, Washington.
- DOE U.S. Department of Energy. 1994g. Hanford Remedial Action Draft Environmental Impact Statement. DOE/DEIS-0222, Washington, D.C.

- DOE U.S. Department of Energy. 1994h. Richland Environmental Restoration Project Plan. DOE/RL-92-08, Richland, Washington.
- DOE U.S. Department of Energy. 1995. Hanford Site Risk Assessment Methodology. DOE/RL-91-45, Rev. 3, Richland, Washington.
- DOE U.S. Department of Energy. 1996a. Hanford Site Background: Part 2, Soil Background for Radionuclides. DOE/RL-96-12, Richland, Washington.
- DOE U.S. Department of Energy. 1996b. Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement. DOE/EIs-0189, Richland, Washington.
- Dunks, K.L. 1995. 100 Area River Effluent Pipelines Characterization Report. BHI-00538, Rev. 00, Bechtel Hanford, Inc., Richland, Washington.
- Ecology Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy. 1994. Hanford Federal Facility Agreement and Consent Order. Document No. 89-10, Rev. 3 (The Tri-Party Agreement), Olympia, Washington.
- EG&G Energy Measurements. 1990. An Aerial Radiological Survey of the Hanford Site and Surrounding Area, Richland, Washington. EGG-10617-1062, The Remote Sensing Laboratory, Las Vegas, Nevada.
- EPA U.S. Environmental Protection Agency. 1985. "OHM/TADS Oil and Hazardous Materials/ Technical Assistance Data System." In TOMES--Toxicology, Occupational Medicine, and Environmental Series (CD-ROM). Database used: Micromedex.
- EPA U.S. Environmental Protection Agency. 1989. Risk Assessment Guidance for Superfund; Human Health Evaluation Manual Part A. Interim Final, EPA/540/1-89/002, Washington D.C.
- EPA U.S. Environmental Protection Agency. 1991. EPA Region 10 Supplemental Risk Assessment Guidance for Superfund. Published Draft. Washington, D.C.
- EPA U.S. Environmental Protection Agency. 1992. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; States' Compliance; Final Rule (Federal Register). Vol. 57, No. 246. 12-22-92. Washington, D.C.
- EPA U.S. Environmental Protection Agency. 1994a. Health Effects Assessment Summary Tables. FY-1994 Annual. EPA 540/R/94/020, Washington, D.C.
- Eslinger, P.W., L.R. Huesties, A.D. Maughan, T.B. Miley, and W.H. Walters. 1994. Data Compendium for the Columbia River Impact Assessment. PNL-9785, Pacific Northwest Laboratory, Richland, Washington.

I-7.4 DRAFT DOE/RL-96-16



Ford, B.H. 1993. Groundwater Field Characterization Report for the 200 Aggregate Area Management Study. WHC-SD-EN-TI-020, Westinghouse Hanford Company, Richland, Washington.

Freshley, M.D., and M.J. Graham. 1988. Estimation of Ground-Water Travel Time at the Hanford Site: Description, Past Work, and Future Needs. PNL-6328, Pacific Northwest Laboratory, Richland, Washington.

Fowler, K.M., K.B. Miller, M.O. Hogan, J.E. Donaghue. 1993. Risk-Based Standards Chemicals of Interest Database Documentation. Prepared by Pacific Northwest Laboratory for the U.S. Department of Energy, Richland, Washington.

Hartman, M.J., and K.A. Lindsey. 1993. Hydrogeology of the 100-N Area, Hanford Site, Washington. WHC-SD-EN-EV-027, Westinghouse Hanford Company, Richland, Washington.

Hope, S.J., and R.E. Peterson. 1995. Chromium Concentrations in 100-H Reactor Area Pore Water within Chinook Salmon Spawning Habitat of the Hanford Reach, Columbia River. BHI-00345, Bechtel Hanford, Inc., Richland, Washington.

Kipp, K.L., A.E. Reisenauer, C.R. Cole, and C.A. Bryan. 1976. Variable Thickness Transient Groundwater Flow Model Theory and Numerical Implementation. BNWL-1703, Pacific Northwest Laboratory, Richland, Washington.

Law, A.G. 1990. Status of Groundwater in the 1100 Area. Correspondence Number 8900604B R4, Westinghouse Hanford Company, Richland, Washington.

Napier, B.A. 1993. Determination of Key Radio nuclides and Parameters Related to Dose from the Columbia River Pathway. BN-SA-3768 HEDR, Battelle, Pacific Northwest Laboratories, Richland, Washington.

Napier, B.A., R.A. Peloquin, D.L. Strenge, and J.V. Ramsdell. 1988. GENII - The Hanford Environmental Radiation Dosimetry Software System; Volume 1: Conceptual Representation. PNL-6584 Vol. 1, Pacific Northwest Laboratory, Richland, Washington.

Navy - U.S. Department of the Navy. 1984. Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Naval Submarine Reactor Plants. Washington, D.C.

NCRP - National Council on Radiation Protection and Measurements. 1989. Limit for Exposure to "Hot Particles" on the Skin. NCRP Report No. 106, Bethesda, Maryland.

Peterson, R.E., and V.G. Johnson. 1992. Riverbank Seepage of Groundwater Along the 100 Areas Shoreline, Hanford Site. WHC-EP-0609, Westinghouse Hanford Company, Richland, Washington.

Raymond, J.R., D.A. Myers, J.J. Fix, V.L. McGhan, and P.M. Schrotke. 1976. Environmental Monitoring Report on Radiological Status of the Ground Water Beneath the Hanford Site, January - December 1974. BNWL-1970, Pacific Northwest Laboratory, Richland, Washington.

RCW - Revised Code of Washington. 1985. "Hazardous Waste Management Act." RCW 70.105, Olympia, Washington.

Rhoads, K., B.N. Bjornstad, R.E. Lewis, S.S. Teel, K.J. Cantrell, R.J. Serne, J.L. Smoot, C.T. Kincaid, and S.K. Wurstner. 1992. Estimation of the Release and Migration of Lead Through Soils and Groundwater at the Hanford Site 218-E-12B Burial Ground. PNL-8356 Vol. 1., Pacific Northwest Laboratory, Richland, Washington.

Rhoads, K., B.N. Bjornstad, R.E. Lewis, S.S. Teel, K.J. Cantrell, R.J. Serne, L.H. Sawyer, J.L. Smoot, J.E. Szecsody, M.S. Wigmosta, and S.K. Wurstner. 1994. Estimation of the Release and Migration of Nickel Through Soils and Groundwater at the Hanford Site 218-E-12B Burial Ground. PNL-9791, Pacific Northwest Laboratory, Richland, Washington.

Rowley, C.A. 1993. 100-N Area Underground Storage Tank Closures. WHC-SD-EN-TI-136, Westinghouse Hanford Company, Richland, Washington.

SARA - Superfund Amendments and Reauthorization Act of 1986. Public Law 99-499, 100 Statute 1613, as amended, codified as amended in various sections of 10, 26, 29 and 42 USC.

Sula, M.J. 1980. Radiological Survey of Exposed Shorelines and Islands of the Columbia River Between Vernita and the Snake River Confluence. PNL-3127, Pacific Northwest Laboratory, Richland, Washington.

Thatcher, A.H. 1995. 100N Area Shoreline Radiation Survey and Dose Evaluation, Washington State Department of Health, Olympia, Washington.

Wade, C.D., and M.A. Wendling. 1994. 100-D Island USRADS Radiological Surveys Preliminary Report Phase II. BHI-00-134, Bechtel Hanford, Inc., Richland, Washington.

Weiss, S.G. 1993. 100 Area Columbia River Sediment Sampling. WHC-SD-EN-TI-198, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Wells, D. 1994. Radioactivity in Columbia River Sediments and Their Health Effects. Special Report, Washington State Department of Health, Olympia, Washington.

Woodruff, R.K., R.W. Hanf, and R.E. Lundgren. 1992. Hanford Site Environmental Report for Calendar Year 1991. PNL-8148, Pacific Northwest Laboratory, Richland, Washington.

Woodruff, R.K., R.W. Hanf, and R.E. Lundgren. 1993. Hanford Site Environmental Report for Calendar Year 1992. PNL-8682, Pacific Northwest Laboratory, Richland, Washington.

I-7.6 Draft doe/rl-96-16



Wurstner, S.K., and J.L. Devary. 1993. Hanford Site Ground-Water Model: Geographical Information System Linkages and Model Enhancements, FY1993. PNL-8991, Pacific Northwest Laboratory, Richland, Washington.

### Section 3.0 Data

Barnett, V., and T. Lewis. 1994. Outliers in Statistical Data. Third edition, Wiley and Sons, New York.

Brulotte, P.J. 1994. Tri-Party Agreement Databases, Access Mechanism and Procedures. DOE/RL-93-69, U.S. Department of Energy, Richland, Washington.

Dresel, P.E., P.D. Thorne, S.P. Luttrell, B.M. Gillespie, W.D. Webber, J.K. Merz, J.T. Rieger, M.A. Chamness, S.K. Wurstner, and B.E. Opitz. 1995. Hanford Site Ground-Water Monitoring for 1994. PNL-10698, Pacific Northwest Laboratory, Richland, Washington.

Dunks, K.L. 1995. 100 Area River Effluent Pipelines Characterization Report. BHI-00538, Rev. 00, Bechtel Hanford, Inc., Richland, Washington.

Ecology - Washington State Department of Ecology. 1993. Class II Inspection of the Boise Cascade Pulp and Paper Mill, Washington - April 1992. Olympia, Washington.

EPA - U.S. Environmental Protection Agency. 1990. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A). EPA/540/1-89/002, Office of Emergency and Remedial Response, Washington, D.C.

Eslinger, P.W., L.R. Huesties, A.D. Maughan, T.B. Miley, and W.H. Walters. 1994. Data Compendium for the Columbia River Comprehensive Impact Assessment. PNL-9785, Pacific Northwest Laboratory, Richland, Washington.

ESRI - Environmental Systems Research Institute. 1994. ARC COMMANDS. Redlands, California.

Ford, B.H., C.W. Denslow, and R.E. Peterson. 1996. Method for Evaluating Groundwater Analytical Data. BHI00757, Bechtel Hanford, Inc., Richland, Washington.

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, New York.

Hope, S.J., and R.E. Peterson. 1995. Chromium Concentrations in 100-H Reactor Area Pore Water within Chinook Salmon Spawning Habitat of the Hanford Reach, Columbia River. BHI-00345 Rev. 0A, Bechtel Hanford, Inc., Richland, Washington.

Hope, S.J., and R.E. Peterson. 1996. Chromium in River Substrate Water and Adjacent Groundwater: 100-D/DR Area, Hanford Site, Washington. BHI-00778, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

OHD - Oregon Health Division. 1994. Environmental Radiological Surveillance Report on Oregon Surface Waters 1961-1993. Volumes I and II, Portland, Oregon.

Peterson, R.E. 1994. "183-H Solar Evaporation Basins." In Annual Report for RCRA Groundwater Monitoring Projects at Hanford Site Facilities for 1993. DOE/RL-93-88, Rev. 0, U.S. Department of Energy, Richland, Washington.

Schreck, R.I. 1993. Hanford Environmental Information System - HEIS Users Manual, Rev 1 and Vol I. WHC-EP-0372, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Thiessen, A.H., and J.C. Alter. 1911. "Climatological Data for July 1911: District No. 10, Great Basin." Monthly Weather Review, 39:1082-1089.

USACE - U.S. Army Corps of Engineers. 1991. Non-Federal Navigation Dredging and Beneficial Use of Dredge Material in the Columbia and Snake Rivers. ACOE.7/11-18-91/01924A, Walla Walla, Washington.

## Section 4.1 Species

61 FR 7595-7613. February 28, 1996. "Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species." Federal Register.

Becker, C.D. 1990. Aquatic Bioenvironmental Studies: The Hanford Experience 1944-84. Elsevier Publishers, New York.

Brandt, C.A., C.E. Cushing, W.H. Rickard, N.A. Cadoret, and R. Mazaika. 1993. Biological Resources of the 300-FF-5 Operable Unit. WHC-SD-EN-TI-121, Westinghouse Hanford Company, Richland, Washington.

Cushing, C.E. 1995. Hanford Site National Environmental Policy Act (NEPA) Characterization. PNL-6415 Rev. 7, Pacific Northwest Laboratory, Richland, Washington.

Dauble, D.D., and D.G. Watson. 1990. Spawning and Abundance of Fall Chinook Salmon (Oncorhynchus tshawytscha) in the Hanford Reach of the Columbia River, 1948-1988. PNL-7289, Pacific Northwest Laboratory, Richland, Washington.

Dirkes, R.L., and R.W. Hanf. 1996. Hanford Site Environmental Report for Calendar Year 1995. PNNL-11139, Pacific Northwest National Laboratory, Richland, Washington.

Fickeisen, D.H., R.E. Fitzner, R.H Sauer, and J.L. Warren. 1980. Wildlife Usage, Threatened and Endangered Species and Habitat Studies of the Hanford Reach, Columbia River, Washington. Pacific Northwest Laboratories, Richland, Washington.

I-7.8 Draft doe/rl-96-16



Fitzner, R.E., and R.H. Gray. 1991. "The Status, Distribution and Ecology of Wildlife on the U.S. DOE Hanford Site: A Historical Overview of Research Activities." Environmental Monitoring and Assessment, 18:173-202.

Gray, R.H., and D.D. Dauble. 1977. "Checklist and Relative Abundance of Fish Species from the Hanford Reach of the Columbia River." Northwest Science, 51: 208-215.

Landeen, D.S., M.R. Sackschewsky, and S. Weiss. 1993. 100 Areas CERCLA Ecological Investigations. WHC-EP-0620, Westinghouse Hanford Company, Richland, Washington.

Neitzel, D.A., T.L. Page, and R.W. Hanf, Jr. 1982a. "Mid-Columbia River Microflora." Journal of Freshwater Ecology 1:495-505.

Neitzel, D.A., T.L. Page, and R.W. Hanf, Jr. 1982b. "Mid-Columbia River Zooplankton." Northwest Science, 57:111-118.

Page, T.L., D.D. Dauble, and D.A. Neitzel. 1982. Columbia River Aquatic Ecological Studies near the Skagit/Hanford Nuclear Project: Final Report. Prepared by Battelle, Pacific Northwest Laboratories under Contract 2311204323 for the Northwest Energy Services Company, Bellevue, Washington.

Sackschewsky, M.R., D.S. Landeen, G.I. Baird, W.H. Rickard, and J.L. Downs. 1992. Vascular Plants of the Hanford Site. WHC-EP-0554, Westinghouse Hanford Company, Richland, Washington.

USACE - U.S. Army Corps of Engineers. 1976. Inventory of Riparian Habitats and Associated Wildlife Along the Columbia and Snake Rivers. Portland, Oregon.

WDW - Washington Department of Wildlife. 1994. Species of Special Concern in Washington. Olympia, Washington.

Weiss, S.G., and R.M. Mitchell. 1992. A Synthesis of Ecological Data from the 100 Areas of the Hanford Site. WHC-EP-0601, Westinghouse Hanford Company, Richland, Washington.

West, N.E. 1988. "Intermountain Deserts, Shrub Steppes, and Woodlands." North American Terrestrial Vegetation, eds. M.G. Barbour and W.D. Billings, pp. 209-230. Cambridge University Press, New York.

Whicker, F.W. and V. Schultz. 1982. Radioecology: Nuclear Energy and the Environment, Volume II. CRC Press, Boca Raton, Florida.

WNHP - Washington Natural Heritage Program. 1994. Endangered, Threatened, and Sensitive Vascular Plants of Washington. Washington Department of Natural Resources, Olympia, Washington.

### Section 4.2 Ecological Risk

Adriano, D.C. 1986. Trace Elements in the Terrestrial Environment. Springer Verlag, Inc., New York.

AEC - U.S. Atomic Energy Commission. 1973. Toxicity of Power Plant Chemicals to Aquatic Life. WASH-1249, Washington, D.C.

Babich, H., C. Gamba-Vitalo, and G. Stotzky. 1982. "Comparative Toxicity of Nickel to Mycelial Proliferation and Spore Formation of Selected Fungi." Archives of Environmental Contamination and Toxicology 11:465-468.

Baker, D.A., and J.K. Soldat. 1992. Methods for Estimating Doses to Organisms from Radioactive Materials Released into the Aquatic Environment. PNL-8150, Pacific Northwest Laboratory, Richland, Washington.

Battelle. 1977a. Vol 2. Aquatic Ecological Studies Near WNP 1,2, and 4 September 1974 through September 1975. May 1977. To United Engineers and Constructors for Washington Public Power Supply System. Contract 2311201335.

Battelle. 1977b. Vol 3. Aquatic Ecological Studies Near WNP 1,2, and 4 October 1975 through February 1976. July 1977. To United Engineers and Constructors for Washington Public Power Supply System. Contract 2311201335.

Battelle. 1978. Vol 4. Aquatic Ecological Studies Near WNP 1,2, and 4 March through December 1976. To United Engineers and Constructors for Washington Public Power Supply System. July 1978. Contract 2311201335.

Battelle. 1979a. Vol 5. Aquatic Ecological Studies near WNP 1,2, and 4 January through December 1977. March 1979. Prepared for Washington Public Power Supply System under Contract 2311203104.

Battelle. 1979b. Vol 6. Aquatic Ecological Studies near WNP 1,2, and 4 January through August 1978. Prepared for Washington Public Power Supply System under Contract 2311203104. June 1979.

Becker, C.D. 1973. "Food and Growth Parameters of Juvenile Chinook Salmon, Oncorhynchus tshawytscha, in central Columbia River." Fisheries Bulletin 71:387-400.

Beeby, A. 1991. "Toxic Metal Uptake and Essential Metal Regulation in Terrestrial Invertebrates: A Review." In M.C. Newman and A.W. McIntosh, eds, Metal Ecotoxicology, Concepts and Applications, pp. 65-89, Lewis Publishers, Boca Raton, Florida.

Beyer, W.N., E.E. Connor, and S. Gerould. 1994. "Estimates of Soil Ingestion by Wildlife." Journal of Wildlife Management 58:375-382.

Beyer, W.N., G. Miller, and J.W. Simmers. 1990. "Trace Elements in Soil and Biota in Confined Disposal Facilities for Dredged Material." Environmental Pollution 65:19-32.

I-7.10 Draft doe/rl-96-16



Borgmann, U., and W.P. Norwood. 1995. "Kinetics of Excess (Above Background) Copper and Zinc in Hyalella Azteca and their Relationship to Chronic Toxicity." Canadian Journal of Fisheries and Aquatic Science 52:864-874.

Brandt, C.A., C.E. Cushing, W.H. Rickard, N.A. Cadoret, and R. Mazaika. 1993. Biological Resources of the 300-FF-5 Operable Unit. WHC-SD-EN-TI-121, Revision 0. Westinghouse Hanford Company, Richland, Washington.

Branica, M., and Z. Konrad, eds. 1980. Lead in the Marine Environment. Pergamon Press, Oxford, England.

Campbell, G.C., and A. Tessier. 1996. "Ecotoxicology of Metals in the Aquatic Environment: Geochemical Aspects." In M.C. Newman and C.H. Jagoe, eds., Ecotoxicology: A Hierarchical Treatment, pp. 11-58, Lewis Publishers, Boca Raton, Florida.

Canada - Government of Canada. 1993a. Priority Substances List Supporting Document: Benzene. Environment Canada, Ottowa, Ontario.

Canada - Government of Canada. 1993b. Priority Substances List Supporting Documents: Xylenes. Environment Canada, Ottowa, Ontario.

Canada - Government of Canada. 1994. Priority Substances List Supporting Documentation - Environmental Sections: Nickel and Its Compounds. Environment Canada, Ottowa, Ontario.

Chapman, P.M., H.E. Allen, K. Godtfredsen, and M.N. Z'Graggen. 1996. "Evaluation of Bioaccumulation Factors in Regulating Metals." Environmental Science and Technology 30: 448A-452A.

Chu, A., T.A. Thayer, B.W. Floyd, O.F. Unites, and J.F. Roetzer. 1978. Copper in the Aquatic Environment: A Literature Review for Washington Public Power Supply Systems. Envirosphere Company, Bellevue, Washington.

Connell, D.W. 1990. Bioaccumulation of Xenobiotic Compounds. CRC Press, Boca Raton, Florida.

Coughtrey, P.J., and M.C. Thorne. 1983. Radionuclide Distribution and Transport in Terrestrial and Aquatic Ecosystems. Volumes 1-6, A.A. Balkema, Rotterdam, Netherlands.

Cowherd, C., G. Muleski, P. Engelhart, and D. Gillete. 1985. Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination. EPA/600/8-85/002, U.S. Environmental Protection Agency, Washington, D.C.

Dallinger, R., and H. Kautzky. 1985. "The Importance of Contaminated Food for the Uptake of Heavy Metals by Rainbow Trout (Salmo gairdneri): A Field Study." Oecologia 67:82-89.

Dauble, D.D. 1986. "Life History and Ecology of the Largescale Sucker (Catostomus macrocheilus) in the Columbia River." American Midland Naturalist 116:356-367.

Dauble, D.D., and T.M. Poston. 1994. "Radionuclide Concentrations in White Sturgeons from the Hanford Reach of the Columbia River." Transactions of the American Fisheries Society 123:565-573.

Dauble, D.D., R.H. Gray, and T.L. Page. 1980. "Importance of Insects and Zooplankton in the Diet of 0-age Chinook Salmon (Oncorhynchus tshawytscha) in the Central Columbia River." Northwest Science 54:253-258.

Domingo, J.L., J.M. Llobet, J.M. Tomas, and J. Corbella. 1987. "Acute Toxicity of Uranium in Rats and Mice." Bulletin Environmental Contamination Toxicology 39:168-174.

Driver, C.J. 1994. Ecotoxicity Literature Review of Selected Hanford Site Contaminants. PNL-9394, Pacific Northwest Laboratory, Richland, Washington.

Dunning, J.B. 1993. CRC Handbook of Avian Body Masses. CRC Press, Boca Raton, Florida.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. The Birder's Handbook. Simon and Schuster, New York.

Eisenbud, Merril. 1987. Environmental Radioactivity: From Natural, Industrial, and Military Sources. Academic Press, New York.

Ennor, H.R. 1991. Birds of the Tri-Cities and Vicinity. Lower Columbia Basin Audubon Society, Richland, Washington.

EPA - U.S. Environmental Protection Agency. 1979. Water-Related Environmental Fate of 129 Priority Pollutants, Volume I: Introduction and Technical Background, Metals and Inorganics, Pesticides and PCBs. EPA/440/4-79-029A, Washington, D.C.

EPA - U.S. Environmental Protection Agency. 1986. Quality Criteria for Water. EPA 440/5-86-001, Washington, D.C.

EPA - U.S. Environmental Protection Agency. 1991. Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals). Publication 9285.7-01B, Washington, D.C.

EPA - U.S. Environmental Protection Agency. 1992a. Framework for Ecological Risk Assessment. EPA/630/R-92/001, Washington, D.C.

EPA - U.S. Environmental Protection Agency. 1992b. Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B, Washington, D.C.

I-7.12 Draft doe/rl-96-16



- EPA U.S. Environmental Protection Agency. 1993. Wildlife Exposure Factors Handbook, Volume I. EPA/600/R-93/187A, Washington, D.C.
- EPA U.S. Environmental Protection Agency. 1996a. Proposed Guidelines for Ecological Risk Assessment. EPA/630/R-95/002B, Washington, D.C.
- EPA U.S. Environmental Protection Agency. 1996b. ECOTOX: Ecotoxicology Database System, Version I. Online database available from Systems Operator (218) 733-0789, Washington, D.C.
- EPA U.S. Environmental Protection Agency. 1996c. "OHM-TADS: Oil and Hazardous Materials Technical Assistance Data System." In: Tomes Plus, Volume 27, CD-ROM (expired 1/31/96), available from Micromedex, Inc., Englewood, Colorado.

Everard, M., and P. Denny. 1985. "Particulates and the Cycling of Lead in Ullswater, Cumbria." Freshwater Biology 15:215-226.

Fisher, N.S., V.T. Breslin, and M. Levandowsky. 1995. "Accumulation of Silver and Lead in Estuarine Microzooplankton." Marine Ecology - Progress Series116:207-215.

Fitzner, R.A., and W.H. Rickard. 1975. Avifauna of Waste Ponds ERDA Hanford Reservation, Benton County, Washington. BNWL-1885, Pacific Northwest Laboratory, Richland, Washington.

Fitzner, R.A., and G.E. Schreckhise. 1979. The American Coot (Fulica americana) on the Hanford Site. Part 1: Nesting Biology. PNL-2462, Pacific Northwest Laboratory, Richland, Washington.

Förstner, U., and G.T.W. Wittmann. 1981. Metal Pollution in the Aquatic Environment. Springer-Verlag, Berlin.

Franson, J.C. 1996. "Interpretation of Tissue Lead Residues in Birds Other Than Wildlife." In W.N. Beyer, Heinz, G.H., and A.W. Redmon-Norwood, eds., Environmental Contaminants in Wildlife, pp. 265-279, Lewis Publishers, Boca Raton, Florida.

Fuhrer, G.J., D.J. Cain, S.W. McKenzie, J.F. Rinella, J.K. Crawford, K.A. Skach, and M.I. Hornberger. 1996. Surface-Water-Quality Assessment of the Yakima River Basin in Washington: Spatial and Temporal Distribution of Trace Elements in Water, Sediment, and Aquatic Biota, 1987-91. Open File Report 95-440, U.S. Geological Survey, Portland, Oregon.

Gee, G.W., and J.W. Bauder. 1986. "Particle-Size Analysis." In A. Klute, ed., Methods of Soil Analysis. Part 1. Physical and Mineralogical Methods, Second Edition, pp. 383-411, American Society of Agronomy, Madison, Wisconsin.

Gerhardsson, L., and S. Skerfving. 1996. "Concepts on Biological Markers and Biomonitoring for Metal Toxicity." In L.W. Chang, ed., Toxicology of Metals, pp. 81-107, Lewis Publishers, Boca Raton, Florida.

Green, B.T., C.T. Wiberg, J.L. Woodruff, E.W. Miller, V.L. Poage, D.M. Childress, J.A. Feulner, S.A. Prosch, J.A. Runkel, R.L. Wanderscheid, M.D. Wierma, X. Yang, H.T. Choe, and S.D. Mercurio. 1996. "Phytotoxicity Observed in Tradescantia Correlates with Diesel Fuel Contamination in Soil." Environmental and Experimental Botany 36(3):313-321.

Gupta, M., S. Sinha, and P. Chandra. 1994. "Uptake and Toxicity of Metals in Scirpus lacustris L. and Bacopa monnieri." Journal of Environmental Science and Health: Part A Environmental Science and Engineering 29(10):2185-2202.

Gupta, M., S. Sinha, and P. Chandra. 1996. "Copper-Induced Toxicity in Aquatic Macrophyte, Hydrilla verticillata: Effect of pH." Ecotoxicology 5:23-33.

Halfon, E., N. Schito, and R.E. Ulanowicz. 1996. "Energy Flow through the Lake Ontario Food Web: Conceptual Model and an Attempt at Mass Balance." Ecological Modelling 86:1-36.

Hall, T.M. 1982. "Free Ionic Nickel Accumulation and Localization in the Freshwater Zooplankter, Daphnia magna." Limnology and Oceanography 27:718-727.

Hanson, W.C., and R.L. Browning. 1956. "Role of Food Habits in Wildlife Contamination at Hanford." In H.A. Kornberg, ed. Biological Research Annual Report 1956, pp. 201-208, HW-47500, Hanford Works, Richland, Washington.

Harrison, J.D. 1991. "The Gastrointestinal Absorption of the Actinide Elements." Science Total Environment 100:43-60.

Harrison, J.D., and J.W. Stather. 1981. "The Gastrointestinal Absorption of Protactinium, Uranium and Neptunium in the Hamster." Radiation Research 88:47-55.

Harrison, J.D., D.S. Popplewell, and A.J. David. 1984. "The Effect of Concentration and Chemical Form on the Gastrointestinal Absorption of Neptunium." International Journal of Radiation Biology and Related Studies in Physics, Chemistry and Medicine 46:269-278.

Hendriks, A.J. 1995. "Modelling Equilibrium Concentrations of Microcontaminants in Organisms of the Rhine Delta: Can Average Field Residues in the Aquatic Foodchain be Predicted from Laboratory Accumulation?" Aquatic Toxicology 31:1-25.

Hickey, C.W., D.S. Roper, and S.J. Buckland. 1995. "Metal Concentrations of Resident and Transplanted Freshwater Mussels Hyridella menziesi (Unionacea: Hydriidae) and Sediments in the Waikato River, New Zealand." Science Total Environment 175:163-177.

Hill, E.F., and H.H. Soares, Jr. 1984. "Subchronic Mercury Exposure in Coturnix and a Method of Hazard Evaluation." Environmental Toxicology and Chemistry 3:489-502.

I-7.14 DRAFT DOE/RL-96-16



Hope, B.K. 1995. "A Review of Models for Estimating Terrestrial Ecological Receptor Exposure to Chemical Contaminants." Chemosphere 30:2267-2287.

Hope, S.J., and R.E. Peterson. 1995. Chromium Concentrations in 100-H Reactor Area Pore Water within Chinook Salmon Spawning Habitat of the Hanford Reach, Columbia River. BHI-00345, Rev. 0A, Bechtel Hanford, Inc., Richland, Washington.

Hope, S.J., and R.E. Peterson. 1996. Chromium in River Substrate Pore Water and Adjacent Groundwater: 100-D/DR Area, Hanford Site, Washington. BHI-00778, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

Hopkins, B.S., D.K. Clark, M.S. Schlender, and M. Stinson. 1985. Basic Water Monitoring Program, Fish Tissue, and Sediment Sampling for 1984. Washington State Department of Ecology, Olympia, Washington.

Hrudey, S.E., W. Chen, and C.G. Rousseaux. 1996. Bioavailability in Environmental Risk Assessment. CRC Press, Boca Raton, Florida.

Hudson, R.H., R.K. Tucker, and M.A. Haegele. 1984. Handbook of Toxicity of Pesticides to Wildlife. Resource Publication 153, U. S. Fish and Wildlife Service, Washington D.C.

IAEA - International Atomic Energy Agency. 1992. "Effects of Ionizing Radiation on Plants and Animals at Levels Implied by Current Radiation Protection Standards." IAEA Technical Report Series No. 332, pp. 12-23, Vienna, Austria.

Johnsgard, P.A. 1990. Hawks, Eagles, and Falcons of North America. Smithsonian Institution Press, Washington, D.C.

Johnson, A., D. Norton, B. Yake, and S. Twiss. 1990. "Transboundary Metal Pollution of the Columbia River (Franklin D. Roosevelt Lake)." Bulletin of Environmental Contamination and Toxicology 45:703-710.

Jørgensen, S.E. 1990. Modelling in Ecotoxicology. Elsevier Press, Amsterdam.

Jørgensen, S.E., S.N. Nielsen, and L.A. Jørgensen. 1991. Handbook of Ecological Parameters and Ecotoxicology. Elsevier Press, Amsterdam.

Kabata-Pendias, A., and H. Pendias. 1984. Trace Elements in Soils and Plants. CRC Press, Boca Raton, Florida.

Kaye, S.V., and P.B. Dunaway. 1962. "Bioaccumulation of Radioactive Isotopes by Herbivorous Small Mammals. Health Physics 7:205-217.

Kennedy, W.E., and D.L. Strenge. 1992. Residual Radioactive Contamination from Decommissioning - Technical Basis for Translating Contamination Levels to Annual Total Effect Dose Equivalent. NUREG/CR-5512 (PNL-7994), prepared by the Pacific Northwest Laboratory for the Nuclear Regulatory Commission, Washington, D.C.

Kirchner, T.B. 1994. Uncertainty Analysis. Colorado State University, Fort Collins, Colorado.

Landeen, D.S., M.R. Sackschewsky, and S. Weiss. 1993. 100 Areas CERCLA Ecological Investigations. WHC-EP-0620, Westinghouse Hanford Company, Richland, Washington.

Laskey, J.W., J.L. Parrish, and D.S. Cahill. 1973. "Some Effects of Lifetime Parental Exposure to Low Levels of Tritium on the F2 Generation." Radiation Research 56(1):171-179.

Laskowski, R., and S.P. Hopkin. 1996. "Accumulation of Zn, Cu, Pb, and Cd in the Garden Snail (Helix aspersa): Implications for Predators." Environmental Pollution 91:289-297.

La Touche, Y.D., D.L. Willis, and O.I. Dawydiak. 1987. "Absorption and Biokinetics of U in Rats Following an Oral Administration of Uranyl Nitrate Solution." Health Physics 53:332-336.

Lepp, N.W. 1981. Effect of Heavy Metal Pollution on Plants: Volume II. Applied Science Publishers, Englewood, New Jersey.

Lewis, R.J., Sr. 1992. Sax's Dangerous Properties of Industrial Materials. 8th edition, Van Nostrand Reinhold Publishing, New York.

Lewis, R.J., Sr. 1996. Sax's Dangerous Properties of Industrial Materials. 9th edition, Van Nostrand Reinhold Publishing, New York.

Lindqvist, L. 1994. "Metal Uptake and Accumulation During Growth of Aglais urticae (Lepidoptera: Nymphalidae) Larvae." Environmental Entomology 23:975-978.

Lindqvist, L., M. Block, H. Tjalve. 1995. "Distribution and Excretion of Cd, Hg, methy-Hg and Zn in the Predatory Beetle Pterostichus Niger (Coleoptera: Carabicae)." Environmental Toxicology and Chemistry 141195-1201.

Ma, W. 1996. "Lead in Mammals." In W.N. Beyer, Heinz, G.H., and A.W. Redmon-Norwood, eds., Environmental Contaminants in Wildlife, pp.281-296, Lewis Publishers, Boca Raton, Florida.

MacIntosh, D.L., G.W. Suter II, and F.O. Hoffman. 1992. Model of the PCB and Mercury Exposure of Mink and Great Blue Heron Inhabiting the Off-Site Environment Downstream from the U.S. Department of Energy Oak Ridge Reservation. ORNL/ER-90, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

MacIntosh, D.L., G.W. Suter II, and F.O. Hoffman. 1994. "Uses of Probabilistic Exposure Models in Ecological Risk Assessments of Contaminated Sites." Risk Analysis 4:405-419.

I-7.16 Draft doe/rl-96-16



Malley, D.F., A.R. Stewart, and B.D. Hall. 1996. "Uptake of Methyl Mercury by the Floater Mussel, Pyganodon grandis (Bivalvia, Unionidae), Caged in a Flooded Wetland." Environmental Toxicology Chemistry 15:928-936.

Marcus, A.H. 1983. "Compartmental Models for Trace Metals in Mammals." Science of the Total Environment 28:307-316.

Martin, A.C., H.S. Zim, and A.L. Nelson. 1951. American Wildlife and Plants, A Guide to Wildlife Food Habits. Dover Publications, Inc., New York.

Mason, R.P., J.R. Reinfelder, and F.M.M. Morel. 1995. "Bioaccumulation of Mercury and Methylmercury." Water Air and Soil Pollution 80:915-921.

Maughan, J.T. 1993. Ecological Assessment of Hazardous Waste Sites. Van Nostrand Reinhold, New York.

McKone, T.E. 1993. "The Precision of QSAR Methods for Estimating Intermedia Transfer Factors in Exposure Assessments." SAR and QSAR in Environmental Research 1:41-51.

Mount, D.R., A.K. Barth, T.D. Garrison, K.A. Barten, and J.R. Hockett. 1994. "Dietary and Waterborne Exposure of Rainbow Trout (Oncorhynchus mykiss) to Copper, Cadmium, Lead and Zinc using a Live Diet." Environmental Toxicology Chemistry 13:2031-2041.

Munn, M.D., S.E. Cox, and C.J. Dean. 1995. Concentrations of Mercury and Other Trace Elements in Walleye, Smallmouth Bass, and Rainbow Trout in Franklin D. Roosevelt Lake and the Upper Columbia River, Washington, 1994. Open File Report 95-195, U.S. Geological Survey, Tacoma, Washington.

Nagy, K.A. 1983. "Ecological Energetics." In. R.B. Huey, E.R. Pianka, and T.W. Schoener, eds., Lizard Ecology, Studies of a Model Organism, pp. 24-54, Harvard University Press, Cambridge, Massachusetts.

NAS - National Academy of Sciences. 1980. Mineral Tolerance of Domestic Animals. Washington, D.C.

Neitzel, D.A., T.L. Page, and R.W. Hanf, Jr. 1982. "Mid-Columbia River Miroflora." Journal of Freshwater Ecology 1:495-505.

Newman, M.C., and M.G. Heagler. 1991. "Allometry of Metal Bioaccumulation and Toxicity." In M.C. Newman and A.W. McIntosh, eds, Metal Ecotoxicology, Concepts and Applications, pp. 91-130, Lewis Publishers, Boca Raton, Florida.

Ney, J.J., and J.H. Van Hassel. 1983. "Sources of Variability in Accumulation of Heavy Metals by Fishes in a Roadside Stream." Archives of Environmental Contaminants Toxicology 12:701-706.

Nicholls, P.H. 1991. "Organic Contaminants in Soils and Groundwater." In K.C. Jones, ed., Organic Contaminants in the Environment, pp. 87-132, Elsevier Press, London.

NLM - U.S. National Library of Medicine. 1996. "HSDB: Hazardous Substances Databank." In Tomes Plus, Volume 27, CD-ROM (expired 1/31/96), available from Micromedex, Inc., Englewood, Colorado.

NRC - National Research Council. 1990. Health Effects of Exposure to Low Levels of Ionizing Radiation, BEIR V. National Academy Press, Washington, D.C.

NWRI - National Water Research Institute. 1993a. "Chromium and Its Compounds." Canadian Environmental Protection Act, Priority Substances List, Supporting Documentation - Environmental Section. Environment Canada, Hull, Quebec, Canada.

NWRI - National Water Research Institute. 1993b. "Nickel and Its Compounds." Canadian Environmental Protection Act, Priority Substances List, Supporting Documentation - Environmental Section. Environment Canada, Hull, Quebec, Canada.

Odin, M., F. Ribeyre, and A. Boudou. 1995. "Cadmium and Methylmercury Bioaccumulation by Nymphs of the Burrowing Mayfly Hexagenea rigida from the Water Column and Sediment." Environmental Scientific Pollution Research 2:145-152.

Owen, B.A. 1990. "Literature-Derived Absorption Coefficients for 39 Chemicals Via Oral and Inhalation Routes of Exposure." Regulatory Toxicology and Pharmacology 11:237-252.

Paez-Osuna, F., and C. Marmolejo-Rivas. 1990. "Trace Metals in Tropical Coastal Lagoon Bivalves, Crassostrea Croteziensis. Bulletin Environmental Contamination Toxicology 45:538-544.

Pain, J.P. 1996. "Lead in Waterfowl." In W.N. Beyer, Heinz, G.H., and A.W. Redmon-Norwood, eds., Environmental Contaminants in Wildlife, pp. 251-264, Lewis Publishers, Boca Raton, Florida.

Pascoe, G.A., R.J. Blanchet, and G. Linder. 1996. "Food Chain Analysis of Exposures and Risks to Wildlife at a Metals-Contaminated Wetland." Archives of Environmental Contaminant Toxicology 30:306-318.

Pennak, R.W. 1989. Freshwater Invertebrates of the United States. John Wiley & Sons, New York.

Peterson, H.T. 1983. "Terrestrial and Aquatic Food Chain Pathways." In J.E. Till and H.R. Meyer, eds., Radiological Assessment. A Textbook on Environmental Dose Analysis, pp. 5-1-5-156, U.S. Nuclear Regulatory Commission, Washington, D.C.

Piscator, M. 1979. "Copper." In L. Friberg, G.F. Nordberg, and V.B. Vouk, eds., Handbook on the Toxicology of Metals, pp. 411-420, Elsevier Press, Amsterdam.

Polikarpov, G.G. 1966. Radioecology of Aquatic Organisms: The Accumulation and Effect of Radioactive Substances. Reinhold Book Division, New York.

I-7.18 DRAFT DOE/RL-96-16



Post, J.R., R. Vandenbos, D.J. McQueen. 1996. "Uptake Rates of Food-Chain and Waterborne Mercury by Fish: Field Measurements, a Mechanistic Model, and an Assessment of Uncertainty. Canadian Journal of Fisheries and Aquatic Sciences 53:395-407.

Poston, T.M. 1982. "Observations on the Bioaccumulation Potential of Thorium and Uranium in Rainbow Trout (Salmo gairdneri)." Bulletin of Environmental Contaminant Toxicology 28:682-690.

Poston, T.M., D.C. Klopfer, and M.A. Simmons. 1990. "Short-Term Bioconcentration Studies of Np in Freshwater Biota." Health Physics 59:869-877.

Purkayastha, R.P., A.K. Mitra, and B. Bhattacharyya. 1994. "Uptake and Toxicological Effects of Some Heavy Metals on Pleurotus Sajor-Caju (Fr.) Singer." Ecotoxicology and Environmental Safety 27(1):7-13.

Rand, G.M. and S.R. Petrocelli. 1985. Fundamentals of Aquatic Toxicology: Methods and Applications. Hemisphere Publishing Corporation, New York.

Reichle, D.E., D.J. Nelson, and P.B. Dunaway. 1970. Biological Concentration of Radionuclides in Food Chains. ORNL-TM-2492, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Reinfelder, J.R., and N.S. Fisher. 1994. "Retention of Elements Absorbed by Juvenile Fish (Menidia menidia, Menidia beryllina) from Zooplankton Prey." Limnology Oceanography 39:1783-1789.

Richardson, M.L., and S. Gangolli, eds. 1993. The Dictionary of Substances and their Effects. Royal Society of Chemistry, Cambridge, England.

Rickard, W.H., and K.R. Price. 1989. "Uptake of Tritiated Groundwater by Black Locust Trees." Northwest Science 63:87-89.

Rose, K.S.B. 1991. "Lower Limits of Radiosensitivity in Organisms, Excluding Man." Journal of Environmental Radioactivity 15:113-133.

Sample, B.E., D.M. Opresko, G.W. Suter. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. ES/ER/TM-86/R3, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Schmidt-Nielson, K. 1975. Animal Physiology: Adaptation and Environment. 2nd Edition, Cambridge University Press, New York.

Scott, W.B., and E.J. Crossman. 1973. Freshwater Fishes of Canada. Fisheries Research Board of Canada, Ottawa, Canada.

Serder, D. 1993. Retrospective Analysis of Toxic Contaminants in Lake Roosevelt. Evergreen State College, Olympia, Washington.

Serder, D., B. Yake, and J. Cubbage. 1994. Contaminant Trends in Lake Roosevelt. Publication No. 94-185, Washington State Department of Ecology, Olympia, Washington.

Silva, M., and J.A. Downing. 1995. CRC Handbook of Mammalian Body Masses. CRC Press, Boca Raton, Florida.

Smock, L.A. 1983. "The Influence of Feeding Habits on Whole-Body Metal Concentrations in Aquatic Insects." Freshwater Biology 13:301-311.

Spear, P.A., and R.C. Pierce. 1979. Copper in the Aquatic Environment: Chemistry, Distribution, and Toxicology. National Research Council of Canada, NRCC Associate Committee on Scientific Criteria for Environmental Quality, Ottawa, Canada.

Spector, W.S. 1956. Handbook of Biological Data. W.B. Saunders Company, Philadelphia, Pennsylvania.

Stansley, W., and D.E. Roscoe. 1996. "The Uptake and Effects of Lead in Small Mammals and Frogs at a Trap and Skeet Range." Archives of Environmental Contamination and Toxicology, 30:220-226.

Stara, J.F., N.S. Nelson, R.J. Della Rosa, and L.K. Bustad. 1971. "Comparative Metabolism of Radionuclides in Mammals: A Review." Health Physics 20:113-137.

Stebbins, R.C. 1985. Western Reptiles and Amphibians. Houghton Mifflin, New York.

Stevens, J.B. 1992. "Disposition of Toxic Metals in the Agricultural Food Chain. 2. Steady-State Bovine Tissue Biotransfer Factors." Environmental Science and Technology 26:1915-1921.

Stone, W.A., J.M. Thorpe, O.P. Gifford, and D.J. Hoitink. 1983. Climatological Summary for the Hanford Area. PNL-4622, Pacific Northwest Laboratory, Richland, Washington.

Strenge, D.L., and S.R. Peterson. 1989. Chemical Data Bases for the Multimedia Environmental Pollutant Assessment System (MEPAS): Version 1. PNL-7145, Pacific Northwest Laboratory, Richland, Washington.

Sullivan, M.F. 1977. "Gastrointestinal Absorption of Transuranic Elements by Rats." Pacific Northwest Laboratory Annual Report for 1976 to the ERDA Assistant Administrator for Environment and Safety. BNWL-2100, Pacific Northwest Laboratory, Richland, Washington.

Suter, G.W. 1993. Ecological Risk Assessment. Lewis Publishers, Chelsea, Michigan.

Svendsen, G.E. 1982. "Weasels." In J.A. Chapman and G.A. Feldhamer, eds., Wild Mammals of North America, pp. 613-628, Johns Hopkins University Press, Baltimore, Maryland.

I-7.20 Draft doe/rl-96-16



Terres, J.K. 1980. The Audubon Society Encyclopedia of North American Birds. Alfred A. Knopf, New York.

Tessier, L., G. Vaillancourt, and L. Pazdernik. 1994. "Comparative Study of the Cadmium and Mercury Kinetics Between the Short-Lived Gastropod Viviparus geogianus (Lea) and Pelecypod Elliptio complanata (Lightfoot), Under Laboratory Conditions." Environmental Pollution 85:271-282.

Thomann, R.V. 1989. "Bioaccumulation Model of Organic Chemical Distribution in Aquatic Food Chains." Environmental Science and Technology 23:699-707.

Thomann, R.V., J.P. Connolly, and T.F. Parkerton. 1992. "An Equilibrium Model of Organic Chemical Accumulation in Aquatic Food Webs with Sediment Interaction." Environmental Toxicology and Chemistry 11:615-629.

Thomann, R.V., J.D. Mahony, and R. Mueller. 1995. "Steady-State Model of Biota Sediment Accumulation Factor for Metals in Two Marine Bivalves." Environmental Toxicology and Chemistry 14:1989-1998.

Tucker, R.K. and J.S. Lietzke. 1979. "Comparative Toxicity of Insecticides for Vertebrate Wildlife and Fish." Pharmacology and Therapeutics 6:167-270.

Uchiyama, M., Y. Suzuki, and R. Ichikawa. 1986. Gastrointestinal Absorption of Cs.-137, Mn-54 and Zn-65 Administered in Various Chemical Forms in Rat. Annual Report, National Institute of Radiological Sciences, Chiba, Japan.

Urban, D.J. and N.J. Cook. 1986. Hazard Evaluation, Standard Evaluation Procedure, Ecological Risk Assessment. EPA-540/9-85-001, U.S. Environmental Protection Agency, Washington, D.C.

Vanderploeg, H.A., D.C. Parzyck, W.H. Wilcox, J.R. Kercher, and S.V. Kaye. 1975. Bioaccumulation Factors for Radionuclides in Freshwater Biota. ORNL-5002, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Van Hassel, J.H., J.J. Ney, and D.L. Garling. 1980. "Heavy Metals in a Stream Ecosystem at Sites near Highways." Transactions of the American Fisheries Society 109:636-643.

Venugopal, B. and T.D. Luckey. 1978. Metal Toxicity in Mammals, Vol. 2: Chemical Toxicity of Metals and Metalloids. Plenum Press, New York.

Whicker, F.W., J.E. Pinder, J.W. Bowling, J.J. Alberts, and I.L. Brisbin, Jr. 1990. "Distribution of Long-Lived Radionuclides in an Abandoned Reactor Cooling Reservoir." Ecological Monographs 60:471-496.

Wiener, J.G., and D.J. Spry. 1996. "Toxicological Significance of Mercury in Freshwater Fish." In W.N. Beyer, Heinz, G.H., and A.W. Redmon-Norwood, eds., Environmental Contaminants in Wildlife, pp. 297-339, Lewis Publishers, Boca Raton, Florida.

Will, M.E., and G.W. Suter II. 1995. Toxicological Benchmarks for Potential Contaminants of Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1995 Draft. ES/ER/TM-126/R2, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Windell, J.T. 1970. "Food Analysis and Rate of Digestion." In W.E Ricker, ed., Methods for Assessment of Fish Production in Fresh Waters, pp. 197-203, Blackwell Scientific Publications, Oxford and Edinburgh.

Wirth, R., and V. Volf. 1985. "Gastrointestinal Absorption of Np in Rats." Health Physics 5:865-871.

Wolterbeek, H.T., A. Viragh, J.E. Sloof, G. Bolier, B. van der Veer, and J. de Kok. 1995. "On the Uptake and Release of Zinc (Zn-65) in the Growing Alga Selenastrum capricornutum Printz." Environmental Pollution 88:85-90.

Wrenn, M.D.E., P.W. Durvin, B. Howard, J. Lipsztein, J. Rundo, E.T. Still, and D.L. Willis. 1985. "Metabolism of Ingested U and Ra." Health Physics 48:601-633.

Wrenn, M.E., J. Lipstein, and L. Bertelli. 1988. "Pharmacokinetic Models Relevant to Toxicity and Metabolism for Uranium in Humans and Animals." Workshop on Biological Assessment of Occupational Exposure to Actinides, Versailles, France. DOE/NV/10574-2, U.S. Department of Energy, Washington, D.C.

Zaroogian, G.E., and M. Johnson. 1984. "Nickel Uptake and Loss in the Bivalves Crassostrea virginica and Mytilus edulis." Archives of Environmental Contaminant Toxicology 13:411-418.

Zeiner, D.C., W.F. Laudenslayer, K.E. Mayer, and M. White, eds. 1990. "Birds." California's Wildlife, Volume II, Department of Fish and Game, Sacramento, California.

### Section 5.1 Scenarios

40 CFR 50. U.S. Environmental Protection Agency. "National Ambient Air Quality Standards." U.S. Code of Federal Regulations, Title 40, Part 50, Section 6(b).

59 FR 7629 (Executive Order 12898). February 11, 1994. "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Federal Register.

Andelman, J.B. 1990. "Total Exposure to Volatile Organic Chemicals in Potable Water." Significance and Treatment of Volatile Organic Compounds in Water Supplies. N.M Ram, R.F. Christman, K.G. Cantor (eds.). Lewis Publishers, Boca Raton, Florida

CRITFC - Columbia River Inter-Tribal Fish Commission. 1994. A Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin. CRITFC 94-3, Portland, Oregon.

I-7.22 Draft doe/rl-96-16



- Cooper, A.T., and R.K. Woodruff. 1993. Investigation of Exposure Rates and Radionuclide and Trace Metal Distributions Along the Hanford Reach of the Columbia River. PNL-8789, Pacific Northwest Laboratory, Richland, Washington.
- DOA U.S. Department of Agriculture. 1993. Draft Environmental Impact Statement: Wild and Scenic Snake River Recreation Management Plan, Hells Canyon National Recreation Area. Portland, Oregon.
- DOE U.S. Department of Energy. 1990. Hanford Site Development Plan. DOE/RL 89-15, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE U.S. Department of Energy. 1995. Hanford Site Risk Assessment Methodology. DOE/RL-91-45, Rev. 3, Richland, Washington.
- DOI U.S. Department of the Interior. 1942. Report on the Source, Nature and Extent of the Fishing, Hunting and Miscellaneous Related Rights of Certain Indian Tribes in Washington and Oregon Together with Affidavits Showing Locations of a Number of Usual and Accustomed Fishing Grounds and Stations. Los Angeles, California.
- EPA U.S. Environmental Protection Agency. 1989. Exposure Factors Handbook. EPA/600/8-89/043, Office of Health and Environmental Assessment, Washington, D.C.
- EPA U.S. Environmental Protection Agency. 1991a. Standard Default Exposure Factors. OSWER Directive 9285.6-03, EPA, Washington, D.C.
- EPA U.S. Environmental Protection Agency. 1991b. EPA Region 10 Supplemental Risk Assessment Guidance for Superfund. EPA, Seattle, Washington.
- EPA U.S. Environmental Protection Agency. 1992. Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B, US EPA, Washington, D.C.
- Harris, S.G. 1993. "The Nez Perce ERWM's Recommendations for Refinement of Risk Assessment Proposed by DOE's Columbia River Impact Evaluation Plan." Nez Perce Department of Environmental Restoration and Waste Management, Lapwai, Idaho.
- Harris, S.G. 1995. "A Limited Sample of Concerns of the Confederated Tribes of the Umatilla Indian Reservation Community on Using an Appropriately Designed Risk Assessment Model." Scoping Report: Nuclear Risks in Tribal Communities, Appendix B. Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon.
- Hunn, E.S. 1990. Nch'i-wana, "The Big River": Mid-Columbia Indians and Their Land. University of Washington Press, Seattle, Washington.

Jaeger, R.G., E.P. Blizard, A.B. Chilton, M. Grotenhuis, A. Honig, T.A. Jaeger, and H.H Eisenlohr, Eds. 1968. Engineering Compendium on Radiation Shielding, Vol. 1: Shielding Fundamentals and Methods, Springer- Verlag, New York.

NPS - National Park Service. 1994. Hanford Reach of the Columbia River. Comprehensive River Conservation Study and Environmental Impact Statement: Final, Vol. 1. Seattle, Washington.

Paustenbach, D.J. 1989. The Risk Assessment of Environmental and Human Health Hazards: A Textbook of Case Studies. John Wiley & Sons, Inc., New York.

Sula, M.J. 1980. Radiological Survey of Exposed Shorelines and Islands of the Columbia River Between Vernita and the Snake River Confluence. PNL-3127, Pacific Northwest Laboratory, Richland, Washington.

WAC - Washington Administrative Code. 1991. "The Model Toxics Control Act Cleanup Regulations." WAC-173-340 as amended, Olympia, Washington.

Washington Department of Wildlife. 1992. "Game Harvest Report: 1991-92." Olympia, Washington.

Washington Department of Wildlife. 1993. "Game Harvest Report: 1992-93." Olympia, Washington.

Washington Department of Fish and Wildlife. 1994. "Game Harvest Report: 1993-94." Olympia, Washington.

Washington Department of Fish and Wildlife. 1995a. "Game Harvest Report: 1994." Olympia, Washington.

Washington Department of Fish and Wildlife. 1995b. "1995 Hunting Seasons and Rules." Olympia, Washington.

Washington Department of Fish and Wildlife. 1995c. "1994-1995 Migratory Waterfowl Hunting Seasons." Olympia, Washington.

### Section 5.2 Human Health Risk

40 CFR 143. U.S. Environmental Protection Agency, "National Secondary Drinking Water Regulations." U.S. Code of Federal Regulations.

ACGIH - American Conference of Governmental Industrial Hygenists. 1987. Threshold Limit Values and Biological Exposure Indices for 1987-1988. American Conference of Governmental Industrial Hygenists, Cincinnati, Ohio.

Bisping, L.E. 1994. Hanford Site Environmental Data for Calendar Year 1993--Surface and Columbia River. PNL-9824, Pacific Northwest Laboratory, Richland, Washington.

I-7.24 Draft doe/rl-96-16



Burmaster, D.E., and N.I. Maxwell. 1991. "Time and Loading-Dependence in the McKone Model for Dermal Uptake of Organic Chemicals from a Soil Matrix." Risk Analysis 11:491-497.

Cooper, A.T. 1995. Measurement of Environmental Radiation Exposure Rates from Vernita, Hanford Reach, and Richland Area Shores. PNL-8789, Addendum 1, Pacific Northwest Laboratory, Richland, Washington.

Cooper, A.T., and R.K. Woodruff. 1993. Investigation of Exposure Rates and Radionuclide and Trace Metal Distributions along the Hanford Reach of the Columbia River. PNL-8789, Pacific Northwest Laboratory, Richland, Washington.

Danielson, R.A., and R. Jaquish. 1996. 100-D Island Radiological Survey. WDOH/ERS-96-1101, Washington State Department of Health, Olympia, Washington.

Dirkes, R.L., and R.W. Hanf. 1996. Hanford Site Environmental Report for Calendar Year 1995. PNNL-11139, Pacific Northwest National Laboratory, Richland, Washington.

Dunning, D.E., and G. Schwartz. 1981. "Variability of Human Thyroid Characteristics and Estimates of Dose from Ingested Iodine-131." Health Physics 40(5):661-675.

Eckerman, K.F., and J.C. Ryman. 1993. External Exposure to Radionuclides in Air, Water, and Soil. Federal Guidance Report No. 12, EPA/402-R-93-081, U.S. Environmental Protection Agency, Washington, D.C.

Eckerman, K.F, A.B. Wolbarst, and C.B. Richardson. 1988. Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion. Federal Guidance Report No. 11, EPA-520/1-88-020, U.S. Environmental Protection Agency, Washington, D.C.

EG&G Energy Measurements, Inc. 1975. An Aerial Radiological Survey of the U.S. Energy Research and Development Administration's Hanford Reservation (Survey Period: 1973-1974). EGG-1183-1661, Las Vegas, Nevada.

EG&G Energy Measurements, Inc. 1990. An Aerial Radiological Survey of the Hanford Site and Surrounding Area. EGG-10617-1062, Las Vegas, Nevada.

EPA - U.S. Environmental Protection Agency. 1984a. Health Effects Assessment for Copper. EPA/540/1-86-025, Cincinnati, Ohio.

EPA - U.S. Environmental Protection Agency. 1984b. Health Effects Assessment for Lead. EPA/540/1-86-055, Cincinnati, Ohio.

EPA - U.S. Environmental Protection Agency. 1986. Verified Reference Doses (RfDs) of the USEPA. ECAO-CIN-475, Washington, D.C.

EPA - U.S. Environmental Protection Agency. 1992a. Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B, Washington, D.C.

EPA - U.S. Environmental Protection Agency. 1992b. "IRIS: Integrated Risk Information System." In Tomes Plus(r) System, Volume 19, CD-ROM (expired January 31, 1993), available from Micromedix, Inc., Denver, Colorado.

EPA - U.S. Environmental Protection Agency. 1995. Health Effects Assessment Summary Tables (HEAST), FY-1995 Supplement. EPA/540/R-95/142, Washington, D.C.

EPA - U.S. Environmental Protection Agency. 1996. "IRIS: Integrated Risk Information System." In Tomes Plus(r) System, Volume 31, CD-ROM (expires January 31, 1997), available from Micromedix, Inc., Denver, Colorado.

Gibbons, J. 1971. Nonparametric Statistical Inference. McGraw-Hill Book Company, New York, New York.

IAEA - International Atomic Energy Agency. 1994. Handbook of Parameter Values for the Prediction of Radionuclide Transfer in Temperate Environments. Technical Reports Series No. 364, Vienna, Austria.

Layton, D.W., B.J. Mallon, D.H. Rosenblatt, and M.J. Small. 1987. "Deriving Allowable Daily Intakes for System Toxicants Lacking Chronic Toxicity Data." Regulatory Toxicology and Pharmacology 7 (1):96-112.

McKone, T.E. 1990. "Dermal Uptake of Organic Chemicals from a Soil Matrix." Risk Analysis 10(3):407-419.

Morgan, K.Z., and J.E. Turner. 1973. Principles of Radiation Protection: A Textbook of Health Physics. Robert E. Krieger Publishing Company, Huntington, New York.

NCRP - National Council on Radiation Protection and Measurements. 1987. Exposure of the Population in the United States and Canada from Natural Background Radiation. NCRP Report No. 94, Washington, D.C.

NCRP - National Council on Radiation Protection and Measurements. 1989. Limit for Exposure to "Hot Particles" on the Skin. NCRP Report No. 106, Bethesda, Maryland.

NIOSH - National Institute for Occupational Safety and Health. 1996. Registry of Toxic Effects of Chemical Substances (RTECS). Volume 31, CD-ROM (expires January 31, 1997), available from Micromedix, Inc., Denver, Colorado.

Rosenbaum, E.J. 1970. Physical Chemistry. Appleton-Century-Crofts, New York, New York.

I-7.26 Draft doe/rl-96-16



Skowronski, G.A., R.M. Turkall, and M.S. Abdel-Raman. 1988. "Soil Adsorption Alters Bioavailability of Benzene in Dermally Exposed Male Rats." American Industrial Hygienists Association Journal 49:506-511.

Skowronski, G.A., R.M. Turkall, A.R.M. Kadry, and M.S. Abdel-Raman. 1990. "Effects of Soil on the Dermal Bioavailability of M-Xylene in Male Rats." Environmental Research 51:182-193.

Snyder, S.F., W.T. Farris, B.A. Napier, T.A. Ikenberry, and R.O. Gilbert. 1994. Parameters Used in the Environmental Pathways and Radiological Dose Modules (DESCARTES, CIDER, and CRD Codes) of the Hanford Environmental Dose Reconstruction Integrated Codes (HEDRIC). PNWD-2023 HEDR Rev. 1, Battelle, Pacific Northwest Laboratories, Richland, Washington.

Strenge, D.L., and S.R. Peterson. 1989. Chemical Data Bases for the Multimedia Environmental Pollutant Assessment System (MEPAS): Version 1. PNL-7145, Pacific Northwest Laboratory, Richland, Washington.

Sula, M.J. 1980. Radiological Survey of Exposed Shorelines and Islands of the Columbia River between Vernita and the Snake River Confluence. PNL-3127, Pacific Northwest Laboratory, Richland, Washington.

Thatcher, A.H. 1995. 100N Area Shoreline Radiation Survey and Dose Evaluation. WDOH/ERS-95-501, Washington State Department of Health, Olympia, Washington.

Wade, C.D., and M.A. Wendling. 1994. 100-D Island USRADS Radiological Surveys Preliminary Report - Phase II. BHI-00134, Bechtel Hanford, Inc., Richland, Washington.

Wester, R.C., H.I. Maibach, L. Seik, J. Melendres, S. DiZio, I. Jamall, and M. Wade. 1991. "In Vivo Percutaneous Absorption of Cadmium from Water and Soil." Toxicology 11:289.

### Section 6.0 Synthesis

Dirkes, R.L., and R.W. Hanf. 1996. Hanford Site Environmental Report for Calendar Year 1995. PNL-11139, Pacific Northwest National Laboratory, Richland, Washington.

EG&G Energy Measurements, Inc. 1990. An Aerial Radiological Survey of the Hanford Site and Surrounding Area, Richland, Washington. EGG-10617-1062, The Remote Sensing Laboratory, Las Vegas, Nevada.

Johnson, A., D. Norton, B. Yake, and S. Twiss. 1990. "Transboundary Metal Pollution of the Columbia River (Franklin D. Roosevelt Lake)." Bulletin of Environmental Contamination and Toxocology 45:703-710.

Munn, M.D., S.E. Cox, and C.J. Dean. 1995. Concentrations of Mercury and Other Trace Elements in Walleye, Smallmouth Bass, and Rainbow Trout in Franklin D. Roosevelt Lake and the Upper Columbia River, Washington, 1994. Open File Report 95-195, U.S. Geological Survey, Tacoma, Washington.

Pinza, M.R., J.Q. Word, E.S. Barrows, H.L. Mayhew, and D.R. Clark. 1992. Snake and Columbia Rivers Sediment Sampling Project. PNL-8479, Pacific Northwest Laboratory, Sequim, Washington.

Serder, D. 1993. Retrospective Analysis of Toxic Contaminants in Lake Roosevelt. Evergreen State College, Olympia, Washington.

Sula, M.J. 1980. Radiological Survey of Exposed Shorelines and Islands of the Columbia River Between Vernita and the Snake River Confluence. PNL-3127, Pacific Northwest Laboratory, Richland, Washington.

Tri-City Herald. January 26, 1997. "Idaho Swans Likely Died of Lead Poisoning," p. A5.

Wells, D. 1994. Radioactivity in Columbia River Sediments and their Health Effects. Special Report, Washington State Department of Health, Olympia, Washington.

I-7.28 DRAFT DOE/RL-96-16